

# NOTES 15: MORE ON TESTING

Stat 120 | Fall 2025

Prof Amanda Luby

---

## 1 Types of Errors

	$H_0$ True	$H_0$ False
Reject $H_0$		
Do not reject $H_0$		

Type I Error

Type II Error

$\alpha$

$\beta$

Power

Example: A public health researcher believes that there is a positive relationship between heart rate and age among ICU patients. Data from 23 patients gives  $r = 0.037$ . Do you think the probability of a Type II error is higher if  $\rho = .9$  or  $\rho = .1$ ?

$$H_0 : \rho = 0$$

$$H_A : \rho > 0$$

## Big Picture Picture

Sampling Distribution

Bootstrap Distribution

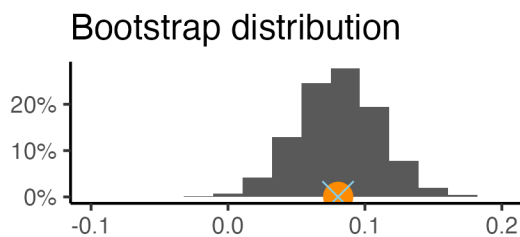
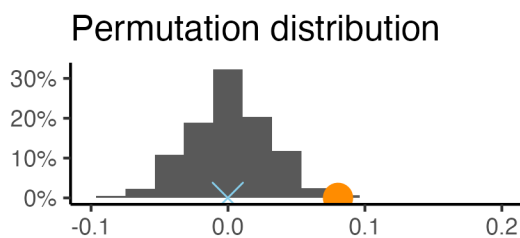
Null Distribution

## 2 Connection to Confidence Intervals

If the value of  $H_0$  is outside of the confidence interval, we \_\_\_\_\_.

If the value of  $H_0$  is inside the confidence interval, we \_\_\_\_\_.

Illustration: (Social Media Poll Example)



## 3 Statistical vs Practical Significance